

## Biennial Report

TSD, LQG, 306 wastestreams, total HW received in 1993 - 5309 tons.

Receives metals-bearing solutions and sludges mainly from metal plating and stripping baths processes.

HW solids generated on-site from wastewater treatment sent to UT, IND(?) and CO for landfilling. Liquid laboratory waste destroyed on-site (what's destruction by chemical precipitation?).

Permit requires compliance with 40 CFR 260-264 & 124 & 270 and Nevada Administrative Code (NAC) 444.8500-444.9335 as specified in the permit. Regulations are those in effect on the date of issuance of the permit: DECEMBER 24, 1986 (to 12/24/91)

## 2.41 METAL SOLUTIONS AND SLUDGES

Metal bearing solutions and sludges are accepted at ETICAM in tank trucks, or containers transported by truck. These materials originate from various operations such as jewelry manufacturing, circuit board manufacturing, metal finishing and others which generate metal containing solutions and sludges.

Storage of liquid waste at ETICAM will be in tanks as shown on Site Plan, Sheet D in Section 8.0 of the Class II Permit Modification Request Revised July 11, 1990. Incoming bulk shipments and containers will be off loaded into storage tanks S-1 through S-28, or directly to the reactors for treatment.

Portable tanks may be removed from the truck and unloaded on the East loading dock or unloading bay when special conditions prohibit mixing in the storage tanks; for instance, small volumes of precious metal bearing wastewater, where treatment requires segregation, or to comply with restrictions for blending wastes; see page 11-11 b & c of section 8.0 of the Class II Permit Modification Request Revisions dated July 11, 1990.

Treatment of metal solutions and sludges at ETICAM will follow the schematic shown in the process flow diagram in Section 8.0 of the Class II Permit Modification Request Revisions dated July 11, 1990. Certain of the

solutions and sludges accepted at ETICAM have sufficient precious and/or valuable metal content to make reclamation economically viable. Once on-site, laboratory testing will confirm whether or not metals can be reclaimed from the material.

If metals can be reclaimed, the material will be processed by either direct filtration or chemical and electrolytic processing. If the solution(s) or sludge does not contain sufficient amounts of precious or valuable metal to make recovery feasible, it will be processed through the treatment system for removal of heavy metal residues. The separated sludge will be shipped off-site to a permitted facility (if hazardous waste by definition or testing) or to a smelter or other manufacturing process as a product.

The separated water phase will be discharged to the public sewer only if all sewer ordinance parameters are met, or evaporated in the evaporator/crystallizer system.

#### 2.42 CYANIDE BEARING WASTES

Cyanide bearing wastes will be stored in holding tanks S-1 thru S-2 and S-12 thru S-15. This waste will then be treated by conventional alkaline chlorination as shown in the process flow diagram in Section 8.0 of the Class II Permit Modification Request Revisions dated July 11, 1990. Cyanide solutions are processed by chemical and

electrolytic methods. The resultant barren solutions will then be processed through the facility's treatment system. In this process the acids and alkalies will be neutralized and any heavy metal residues removed.

The clarified effluent will be discharged to the public sewer system only if all sewer ordinance parameters are met, or evaporated in the evaporator/crystallizer system.

#### 2.43 ACID/ALKALI BEARING WASTES

Acid/alkali bearing wastes will be stored in holding tanks S-3 thru S-6 for alkalies, S-7 thru S-10 for acids, and S-16 thru S-28 for acid wastes. These wastes will then be treated by neutralization and heavy metal precipitation as shown in the process flow diagram in Section 8.0 of the Class II Permit Modification Request Revisions dated July 11, 1990.

Acid/alkali solutions containing sufficient quantities of metals will be first stored in tanks S-16 thru S-28 for acids and tanks S-12 and S-13 for alkali and then processed by chemical and electrolytic methods. The resultant solutions will then be processed through the facility's treatment system.

In this process the acids and alkalies will be neutralized and any heavy metal residues removed as a

metal precipitate. The clarified effluent will be discharged to the public sewer system only if all sewer ordinance parameters are met, or evaporated in the evaporator/crystallizer system.

## 2.50 PROCESS DESIGN CAPACITIES

Because most of the operations carried out at the facility are batch treatment operations, it is difficult to accurately predict the design capacities of the operations. Processing time will vary depending on the concentrations of contaminants in the wastewaters being treated, and other factors. The following table gives annual maximum quantities of waste which will be processed at ETICAM:

Metal bearing solutions	31,000 tons/yr
Cyanide bearing solutions	31,000 tons/yr
Acid/Alkali solution	31,000 tons/yr
Metal hydroxide sludges	31,000 tons/yr

## 2.50 DESCRIPTION OF TREATMENT PROCESS

The treatment system is capable of properly treating all incoming waste acid/alkali, cyanide, spillage and metal bearing solutions.

In addition, the system treats all residual solutions generated from metals recovery operations, and any contaminated supernatant and filtrate from metal hydroxide

sludge processing, or scrubber blowdown. Section 3.9 of the Class II Permit Modification Request Revisions dated July 11, 1990 describes the treatment functions and includes diagrams which show all tanks and auxiliary equipment to be installed. Section 3 of the Class II Permit Modification request Revisions dated July 11, 1990, specifically Tables 3.2 and 3.3, provide lists, capacities and descriptions of all existing and proposed tanks.

The following sections describe typical treatment methods used for most waste streams. ETICAM utilizes many proprietary treatment techniques which will change daily as needed to properly handle the variable wastes received.

New treatment techniques will be reviewed by a plant chemist and/or engineer to evaluate the efficiency and safety of the process. A step by step treatment protocol for each type of treatment is given to the plant operators.

#### 2.61 ACID/ALKALI SOLUTIONS

Acid/alkali solutions are pumped to batch treatment Tanks T-1 thru T-5 for processing. Whenever possible, a waste acid is partially used to neutralize a waste alkali and vice versa. Between 2500 to 6000 gallons are treated per batch. Depending on the resultant pH of the mixture, lime, caustic or acid are added until a pH of approximately 9 is attained. This pH provides for optimal heavy metal precipitation.

The contents of the treatment tank are usually mixed for 30 minutes after which the pH is again adjusted if required. pH monitoring is by means of an in-tank pH probe or portable back up meter. Following this pH readjustment, the contents of the tank is pumped to one of two clarification tanks (C-1 thru C-4) for sludge separation.

Several additional procedures maybe used. These include but are not limited to:

- 1) Sulfide precipitation
- 2) Sodium Borohydride reduction
- 3) DTC precipitation
- 4) Oxidation with peroxide bleach or ozone.
- 5) Thermal decomposition with or without a catalyst.

The following descriptions are typical treatment steps that will vary from day to day based on the individual waste stream being processed.

In the case of sodium sulfide precipitation,  $\text{Na}_2\text{S}$  is added dry or in slurry form (20% solution) at a pH of 7 or greater, until all residual metals are precipitated.

In the case of  $\text{NaBH}_4$ , or DTC the solution is adjusted to a pH of 6.0.  $\text{NaHSO}_3$  is then added in a ration of 1:2 with the total heavy metal present.

The solution is then agitated for 15 minutes and the pH readjusted to 6.5. A 1.2% solution of  $\text{NaBH}_4$  is then added until a reduction potential of -4000 MV is achieved for a period of 15 minutes under agitation.

Redox monitoring is by means of an in-tank Redox probe or portable backup meters. Following pH readjustment, the contents of the tank are pumped to one of four clarification tanks (C-1 thru C-4) for sludge separation.

## 2.62 METAL BEARING SOLUTIONS

The following descriptions are typical treatment steps. The actual treatment used will have variations and differences that depend on the unique makeup of each individual waste stream being processed.

### 2.62.1 UNRECOVERED METAL BEARING SOLUTIONS

Non-cyanide solutions containing concentrations of dissolved heavy metals which have not been recovered will be processed by the procedure described in Section 2.61 for acid/alkali solutions. An exception is for solutions containing complexing agents or hexavalent chrome.



### 2.62.2 SOLUTIONS CONTAINING HEXAVALENT CHROME

) Solutions containing hexavalent chrome must be pretreated prior to its removal as chromium hydroxide. Because of this, hexavalent chrome bearing solutions are stored in tanks S-9, S-10, S-27, or S-28, and pretreated separately from normal acid/alkali or metal bearing wastes.

When a sufficient quantity of hexavalent chrome bearing waste is accumulated, it is pumped to treatment Tanks T-1 thru T-5. If the pH of the mixture is high, it is reduced to 2.5 by the addition of acid. pH monitoring is made using an in-tank pH probe or portable back-up meter.

) After a pH of 2.5 is attained, sodium metabisulfite is added.  $\text{NaHSO}_3$  is a reducing agent which converts hexavalent chrome to its trivalent state. During the  $\text{NaHSO}_3$  addition, acid is added as required to maintain the pH at 2.5 or below. At this pH, conversion of hexavalent to trivalent chrome is most rapid.

Reaction progress is monitored using a hexavalent chrome indicator reagent (diphenyl carbacid). When all hexavalent chrome has been reduced, treatment will proceed as described in Section 2.61 for acid/alkali solutions.

chrome, zinc, silver, gold, nickel and copper recovery along with all ancillary feed tanks, pumps, ion exchange, etc. These process units are considered manufacturing facilities for producing pure metals.

During electrolytic recovery operations, a current is passed through the solution and the metal is electro deposited onto special cathodes. Once the metal is removed, the barren solution is transferred to the appropriate storage tank for subsequent treatment as previously described.

The recovery capacity of these systems is as follows:

<u>Metal</u>	<u>Form</u>	<u>Metal Capacity Per Shift</u>	<u>Volume Capacity Per Shift</u>
Cadmium	Metallic Sheet	1 Ton	32 m <sup>3</sup>
Chrome	Metallic Sheet	1 Ton	32 m <sup>3</sup>
Copper	Metallic Sheet	1 Ton	32 m <sup>3</sup>
Gold	Saturated Resin	200 T.O.	4 m <sup>3</sup>
Silver	Metallic Flake	225 T.O.	7 m <sup>3</sup>
Nickel	Nickel Sulfate (100 gms./lt.)	1 Ton	32 m <sup>3</sup>
Zinc	Metallic Sheet	1 Ton	32 m <sup>3</sup>

The maximum flow rate from the final purification plant is limited to about 100 GPM. This plant will not operate continuously. The flow from the purification plant will be discharged to the continuous flow neutralization plant.

### 2.70 PIPING AND PROCESS CHANGES

Piping, process changes and modifications may be required as technology changes to enhance treatment and recovery. These modifications will be approved under a Class I Modification procedure, with prior approval of the State of Nevada, NDEP.

### 2.71 INCOMING SHIPMENTS

All metal bearing solutions and sludges, cyanides, acid/alkali solutions, and precious metal bearing solutions accepted for storage/treatment by ETICAM will be accompanied by fully completed uniform manifest form and Land Disposal Restriction notifications and certifications as required by regulation. The manifest form used will be acceptable to the State of Nevada. ETICAM will not accept the aforementioned materials unless a manifest accompanies the shipment, and ETICAM has been designated on the manifest by the generator to receive the material. When the state of origin does not classify the material as a hazardous waste, a bill of lading will be used in place of the manifest.

Upon acceptance of a shipment, ETICAM will sign and date the manifest to indicate receipt of said shipment. Any significant manifest discrepancies will be noted on the manifest form (refer to subsection 3.10 of the Waste Analysis Plan).

Copies of the manifest will be distributed as follows:

<u>Manifest Copy</u>		<u>Distribution</u>
Destination State Copy 1	-	ETICAM mails to Environmental Office in State of Nevada
Generator State Copy 2	-	ETICAM mails to Environmental Office in State where waste was generated
Generator Completed Copy 3	-	ETICAM mails to Generator
Facility Copy Copy 4	-	ETICAM retains for at least 3 years
Transporter Copy Copy 5	-	Transporter keeps after signing by ETICAM
Destination State Copy 6	-	Already detached when waste received at ETICAM
Generator State Copy 7	-	Already detached when waste received at ETICAM
Generator Copy Copy 8	-	Already detached when waste received at ETICAM

#### 2.72 OUTGOING SHIPMENTS

Any and all wastes generated at ETICAM during precious/valuable metal reclamation or the described treatment/storage operations which must be shipped off-site for disposal will be evaluated and/or tested prior to shipment to determine whether or not they are hazardous. If the material is determined to be a hazardous waste by definition or testing, it will be shipped by manifest to fully authorized and permitted off-site treatment, storage or disposal facilities.

### 2.02.2 SOLUTIONS CONTAINING MIXTURES AND/OR COMPLEXING AGENTS

Complexing agents such as ammonia can tie up metals in solution and render normal hydroxide precipitation ineffective. Also in this category are spillage wastes from electroplating shops which contain mixtures of various metals.

These wastes are stored and treated separately in order to achieve maximum heavy metals removal.

Procedures for treating these solutions is described in this Section. Generally, laboratory treatability tests are conducted on these types of wastes to determine exact treatment procedures.

#### A. Solutions Containing Nitrite

Solutions containing nitrites (generally neutral or alkaline) are pumped to a treatment tank and agitated. Solid amidosulfuric acid is then added and will be dissolved in the agitated waste water. The amount of amidosulfuric acid is determined in the laboratory during trial tests.

Following this procedure, acid is added slowly until the pH value is adjusted to about 4 - 5. Control is attained by means of a pH measuring probe. This procedure insures that no nitric oxides are formed. The solution is then agitated for about 15 minutes, and the pH raised to 9

with the addition of lime or sodium hydroxide solution.

) The resultant mixture is again agitated for about 15 minutes and the pH readjusted to 3, if necessary. The contents of Tanks T-1 thru T-5 is then pumped to the clarification Tanks C-1 thru C-4 for sludge removal.

B. Solutions Containing The Complexing Agents  
Nitrilo Triacetic Acid, Ethylene Diamine  
Tetraacetic Acid, Hydroxilated Hydrocarbon  
Compounds and Ammoniacal Compounds

) The solution is pumped to treatment Tanks T-1 thru T-5 and the pH adjusted to a value of 3 - 4. NaHSO<sub>3</sub> solution is then added to mixture while it is agitated. The amount of NaHSO<sub>3</sub> is determined by laboratory bench tests. Sodium Sulfide and lime are then added until the mixture pH raises to 12. The solution is then agitated for one hour.

The sludge generated from this treatment is produced separately through one of the clarifiers (C-1 thru C-4).

C. Solutions Containing The Complexing Agents  
Including Organic Amino Compounds

) The solution is pumped to treatment Tanks T-1 thru T-6 and the pH adjusted to between 7 - 12. Sodium sulfide is then added while the mixture is agitated. The exact amount of sodium sulfide is determined by laboratory trial tests.

Following a 20 minute agitation, lime or acid is added until a pH of 9 is attained. The solution is again agitated for 20 minutes.

Sludge generated from this treatment step is processed separately through one of the clarifiers (C-1 thru C-4).

### 2.63 SOLUTIONS CONTAINING CYANIDES

Cyanide bearing solutions are pumped to batch treatment T-5 thru T-7 for processing. With the mixer on, sodium hydroxide solution is added (if required) until a pH of 11 or above is achieved. pH control is by means of a pH monitoring probe.

Sodium hypochlorite solution (normally 15%), hydrogen peroxide, ozone, or sulfur dioxide is then added to oxidize the cyanide. The pH is maintained at 11 by sodium hydroxide solution addition. Reaction progress is monitored by means of an oxidation/reduction potential monitoring probe, and the use of potassium iodide starch test paper (for excess chlorine indication).

When reagent additions are complete, the solution is allowed to agitate for several hours to ensure oxidation of complexed cyanides. An excess chlorine content is monitored during this period by means of the starch test paper. Additional hypochlorite is added as required.

Following the reaction period, any excess chlorine is removed by the addition of  $\text{NaHSO}_3$  solutions. Final pH adjustment to 9 is made in Tank T-1 thru T-7 with the addition of acid.

A pH readjustment is made following a 15 minute agitation and the solution pumped to clarifiers C-1 thru C-4 for sludge separation.

#### 2.64 SLUDGE PROCESSING

The reaction mixture from the treatment of acid/alkali, cyanide, metal bearing and spillage wastes contains suspended metal hydroxide floc which must be removed from the mixture. Four clarifiers will be utilized for this purpose (Tanks C-1 thru C-4). The reaction mixture is pumped to one or more of these clarifiers and the floc is allowed to settle for several hours. During this period, the solid particles agglomerate and settle to the bottom of the clarifier to form a sludge.

If the settling process does not produce a sufficient quantity of clarified water, the whole slurry will be pumped through the filtration system.

Metal hydroxide solids are separated from the sludge by means of a filtration system. The filtrate is further



processed to reduce metal content as determined by testing. The filtrate resulting from the filtering operation is pumped to neutralization Tanks S-29.1 and S-29.2 and/or into the final effluent Tanks (E-1 to E-6).

#### 2.65 FINAL NEUTRALIZATION

The purified wastewater from the clarification and filtration will be pumped to the continuous neutralization process for pH control.

The purified and neutralized wastewater, after this step, is now suitable for ion exchange processing, if required, discharge to the public sewer, or evaporation in the evaporator/crystallizer system.

#### 2.66 FINAL POLISHING - ION EXCHANGE

After detoxification, neutralization and filtration, the wastewater may still contain very small residual amounts of metals. For some waste streams these metal traces can be removed by means of ion exchange.

The clarified wastewater is transferred to pumping Tanks S-29.1 or S 29.2 and/or E-1 through E-6 from which it will undergo final polishing as needed.

Waste water to be treated in the ion exchange will first be pumped through a pressure sand filter filled with

quartz.

This procedure will protect the ion exchange resins from small mechanical impurities and contact with turbid water. From the pressure filter the wastewater flows through one selective anion exchanger and two selective cation exchangers, connected in series. The concentrations of metals in these exchangers can be checked by means of a reagent that indicates heavy metals.

As soon as the capacity of the anion exchange column is exhausted, it will be disconnected and regenerated. During the regeneration cycle, clarified water will be retained in tanks S-29.1 and S-29.2 or E-1 through E-6.

As soon as the capacity of the first cation exchange column is exhausted, it will be disconnected. During this regeneration, the second column will be operated alone. After regeneration, the first column will be reconnected in such a way that it will become the second ion exchange column in the series. This system will prevent the escape of metal ions into the sewer. The ion exchangers are also able to remove small amounts of heavy metals from effluents with high neutral salt contents.

The regeneration of the anion exchangers is performed by means of diluted sodium hydroxide. After the sodium hydroxide treatment, the resin will be washed out. The alkaline regenerant and wash water will be fed into an

appropriate waste storage Tank. The volume of wastewater per regeneration will amount to about 750 gallons per day.

The regeneration of the cation exchanges is performed by means of diluted hydrochloric acid. After the hydrochloric acid treatment, the resin will be washed out, conditioned by means of diluted caustic soda solution, and washed out once more. The regenerant and the wash water will be fed into one of the acid wastewater storage tanks. The volume of wastewater per regeneration will amount to about 800-900 gallons per day.

The water in Tanks E-1 thru E-6 will be discharged to sewer only after it has been sampled and analyzed to confirm compliance with ETICAM's water discharge permit, or evaporated in the evaporator/crystallizer system.

#### 2.67 SOLUTIONS CONTAINING VALUABLE METALS

Solutions containing recoverable concentrations of gold, silver, nickel, or copper will be processed for actual removal of the particular metal. This will be accomplished by the chemical treatment and electrolytic deposition of the metal.

Equipment to be provided for electrolytic recovery/ion exchange of these metals will be located in the filtration room as shown on site plan Sheet D. This equipment basically consists of electrolytic units for cadmium,

Post-it Fax Note	7671	Date	2/24/95	# of pages	5
To	Jean Daniel	From	Nancy Alvarez		
Co./Dept.	EPA	Co.	NDEP		
Phone #	415 744 2128	Phone #	702 687 4670		
Fax #	415 744 1044	Fax #	interesting stuff!		

**F006 LDR Federal Registers**

8/17/88 pp. 31152 - 31153 Final Rule

Today's rule promulgates treatment standards for five constituents proposed for F006 nonwastewaters. Individual standards based on the analysis of TCLP leachates have been established for cadmium, total chromium, lead, nickel, and silver. These treatment standards were established based on the performance of a stabilization process using cement kiln dust as a binding agent. F006 wastewater treatment sludges may contain treatable levels of cyanides. EPA does not consider stabilization - BDAT for the metals in this waste- to be a demonstrated technology for the treatment of cyanide.

Several commenters argued that dewatering technologies such as vacuum filtration, plate and frame pressure filtration, and centrifugation should be allowed and should be the basis for BDAT. While these technologies do reduce the water content in the waste and generally reduce the volume of solid residuals that require disposal, the EPA maintains that these technologies are merely simple physical treatment technologies and generally do not provide any significant treatment of the metals or cyanide contained in the sludge. In cases where dewatering alone produces a residual that can meet the treatment standards, the EPA believes that it is the treatment prior to the dewatering step that has provided the most effective treatment of metal constituents. Dewatering technologies are not precluded from use by this regulation and can be considered applicable technologies when the residuals meet the promulgated treatment standards or when dewatering is incorporated into an additional treatment train that produces a residual that can achieve these levels. Such a treatment train may include treatment technologies such as chromium reduction, cyanide destruction, metals precipitation, settling, filtration (or centrifugation) and solidification.

One commenter identified cases where metal recovery processes have been used for metal-bearing sludges. However, at this time, their applicability to F006 treatment sludges has not been examined in order to develop additional standards. The concentrations and identity of metals in F006 wastes vary depending on the specific metals used in the plating process. EPA has not been able to define any particular subcategories of F006 wastes that would be amenable to a particular recovery process.

6/23/89 pp 26606 - 26611 Final Rule

Today's rule promulgates treatment standards for amenable and total cyanides in F006 nonwastewaters, and for amenable cyanides, total cyanides, and metal constituents in F007, F008, and F009 nonwastewaters and wastewaters. BDAT treatment standards for the nonwastewaters (F006, F007, F008, F009) are based on the performance of alkaline chlorination for the amenable and total cyanides and stabilization for the metal constituents. BDAT

treatment standards for the wastewaters (F007, F008, F009) are based on the performance of alkaline chlorination for the amenable and total cyanides and chemical precipitation followed by settling and filtration for the metals.

6/1/90 pp 22578 - 22580 Final Rule

Today's rule promulgates wastewater treatment standards for amenable and total cyanides and metal constituent for F006 wastewaters as proposed. Wastewater treatment standards are based on the performance of alkaline chlorination for the amenable and total cyanides, and chromium reduction followed by chemical precipitation using lime and sulfides and sludge dewatering for the metals. Detailed information on F006 waste characterization and the technical feasibility of the transfer of the performance of the treatment systems can be found in the Final Addendum to the Best Demonstrated Available Technology (BDAT) Background Document for F006.

1/9/92 pp 974 - 977 Proposed Rule

EPA proposes alternative treatment standards based on High Temperature Metal Recovery (HTMR) as BDAT for F006 and K062 nonwastewaters with recoverable amounts of metals (e.g. greater than 1.5 percent chromium and nickel combination).

The EPA received data and comment indicating that other listed metal-bearing wastes, such as F006 and K062 containing chromium and nickel, have sufficient concentrations of metals and low concentrations of interfering chemicals that make them amenable for recovery of metals in various types of HTMR units. EPA believes that treatment standards for 14 metals based on HTMR will provide a better level of protection to human health and the environment than treatment standards based on stabilization.

The EPA is not proposing these standards as replacement of the existing standards for F006 and K062 wastes, but rather as alternatives to them. While many F006 and K062 wastes are amenable to recovery, the EPA does not have sufficient waste characterization information to specifically define the universe of F006 and K062 wastes that are recoverable. However, by establishing generic exclusion levels and alternative treatment standards for HTMR residues from the recovery of these wastes, EPA is providing a mechanism that will encourage recovery of metals rather than land disposal.

The EPA is proposing to establish HTMR as an alternative BDAT for F006 and K062 nonwastewaters and is proposing to transfer the treatment performance of HTMR for high zinc K061 wastes to F006 and K062 as alternative treatment standards. Some HTMR data submitted for the development of standards for the high zinc K061 wastes also represented treatment of K062 and F006 (i.e., influent to the HTMR process contained a mixture of K061 (both high and low zinc subcategories), K062, and F006). Furthermore, it appears to be

common to mix different metal waste types to achieve specific feed mixtures as a means of optimizing metals recovery.

For F006 nonwastewaters, the Agency is also proposing to establish a treatment level for cyanide because it is a common constituent in most F006 wastes. While the EPA has no specific performance data on the destruction of cyanides in HTMR units, HTMR provides technical similarities to incineration and is expected to achieve a level of destruction similar to incineration.

The EPA is proposing to exclude nonwastewater residues generated by HTMR of F006 and K062 wastes in units identified as rotary kilns, flame reactors, electric furnaces, plasma arc furnaces, slag reactors, and rotary hearth furnace/electric furnace combinations or industrial furnaces (as defined in 40 FR 260.10) from the hazardous waste regulations when disposed in a subtitle D unit, provided the residues meet the generic exclusion levels and part 268 treatment standards for all constituents, and provided the residues do not exhibit one or more of the hazardous waste characteristics.

8/18/92 pp. 37206 - 37209 Final Rule

The January 9, 1992, proposed rule (57 FR 975-977) contained three major provisions for K061, K062, and F006: ....(2) setting alternative treatment standards for K062 and F006 nonwastewaters with recoverable amounts of nickel and chromium; and (3) excluding from regulation as a hazardous waste nonwastewater residues generated from high-temperature metals recovery (HTMR) treatment of F006 and K062 provided the residues meet the designated generic exclusion levels, they are disposed of in a subtitle D unit, and they do not exhibit one or more of the hazardous waste characteristics.

The EPA is promulgating alternative treatment standards for K062 and F006 nonwastewaters as proposed. These treatment standards, based on HTMR, are the same as those promulgated in August 1991 for "high zinc" nonwastewaters and the standards promulgated in this rule for all K061 nonwastewaters.

EPA is also promulgating a new regulatory section (40 CFR 268.46) for any treatment standards serving as alternates for compliance with standards in 40 CFR 268.41, 268.42, and 268.43.

The alternative treatment standards for F006 includes standards for cyanides. Although the EPA has no HTMR performance data for cyanide, EPA believes that HTMR treats cyanide to a level comparable to incineration. Since no commenters challenged this belief and there is no reason to believe HTMR units will not destroy cyanide as efficiently as incineration, EPA is promulgating alternative cyanide standards for F006 developed from incinerator performance. The HTMR-based alternative treatment standards are higher numerically for several constituents (chromium in K062; cadmium, nickel and silver in F006) than the original